

8/10/02  
02/01/02  
15  
20  
25  
30

## GOLF PUTTER HAVING IMPROVED MARKING

### CROSS REFERENCE TO RELATED APPLICATIONS

This application is a continuation in part of application serial number 09/114,523, filed on July 13, 1998, *now U.S. Pat. No. 6,045,452.*

### FIELD OF THE INVENTION

This invention relates to an improved design of a golf putter. More particularly, it relates to a putter having an improved marking enabling a golfer to more accurately line up the putt.

### BACKGROUND OF THE INVENTION

Putting is very important in the game of golf. On a par-72 course, one-half (36) strokes are allotted for putting. Moreover, it does not take great strength or physical ability to be a good putter. For a golfer, one stroke on a green counts just as much as any other stroke in the course.

There are two kinds of putts -- long putts and short putts. A long putt may be defined as any putting requiring more than five feet to reach the cup. If the ball lies within about five feet of the hole, it is a short putt. The primary objective of the long putting is to hit the ball so that it ends within approximately three feet of the hole. Although sinking the ball in a long put is pleasant and desirable, the primary goal on long putts should be placing the ball near enough to the hole so that the next stroke will easily make the hole. In addition, for the long putts many variables such as the slope of the ground, the accuracy of the aim, the length to be traveled, and speed of the ball comes into play. The accuracy of the aim, although critically important, only plays a minor role in the overall success of the long putting. On the other hand, the accuracy is the most important factor in short putting. Other variables such as the slope of the ground, speed of the ball, and texture of the turf become less important.

A short putt is very important in a game of golf not only because a missed putt will cost a stroke, but the impact it has psychologically to a player. Because of its length, every golfer, pros and amateurs alike, feels compelled to make it. When he does not make it, he thinks he missed an easy shot. Consequently, it tends to destroy a player's confidence and may affect his concentration for the rest of the game.

5

10

15  
16  
17  
18  
19  
20  
21  
22  
23  
24

25

In a putting situation, the direction of the putt is dictated by the path of the clubhead and the face angle at impact. The path is important and affects direction, but the face angle of the putter at impact is also very important in determining direction. Providing the green within five feet of the hole has no significant slope and texture of the turf is uniform, successful short putting should require the path of the clubhead directly aimed to center of the hole, and club face angle precisely perpendicular to the line between clubhead and the hole. In addition, the center of the ball should be precisely aligned with the marker on top of the putter that generally indicates location of the center of gravity in the toe to heel direction. An infinitesimal deviation from these is the reason for a miss of the short putt. To miss the hole that is four inches wide, from five feet distance the deviation of a face angle from perpendicular to the straight line to the hole must be so small it will not be discernable to the naked eyes. Every player carefully adjusts the face angle of the putter and aligns the ball to the center of gravity marker before he strokes the ball. Nevertheless, a putt is missed because the face of the putter is not truly perpendicular to the direction of the hole, and the ball is off the center of gravity. To achieve a perfect alignment every time, a finely adjusted machine tool is needed. Since hand and eye coordination of a human being is much less precise than a machine, a mistake will occur and a missed putt is the result. The present invention is directed to reducing the small inaccuracies that occur with the prior art putters and automatically compensating for mis-struck putts.

## SUMMARY OF INVENTION

Accordingly, it is a primary object of the present invention to provide an improved golf putter which automatically compensates for misaligned and mis-struck putts in a short putting situation. A typical putter consists of a putter head about four to five inches long with a predetermined weight distribution and a total weight ranging between fifteen and eighteen ounces. The putting face of a putter is horizontally flat and has two to four degrees of loft. There are many putter designs in the market each claiming why it is superior to others. However, for the short putting situation, the most important attribute of a putter has to be how tolerant making up the infinitesimal and almost invisible error in positioning the face angle and the clubhead path a player makes when the player aims and strokes a ball. If there is a putter with a face shaped such a way that the ball is always aimed toward the center of the hole, probability of making the hole increases significantly even when a player makes a small error in aiming the ball toward the hole. Additionally, putter markings are usually taken for granted, consisting of one or several straight lines. A putter with an enhanced marking would assist the golfer with both centering and aiming the putt.

*10* *15* *20* *25* *30* *35* *40* *45* *50* *55* *60* *65* *70* *75* *80* *85* *90* *95* *100*

The putter of the present invention differs from any other conventional or unconventional style putters in the market today. The putter may be precision machined to form a concave horizontal face from the heel to toe of the hitting face.

*10* *15* *20* *25* *30* *35* *40* *45* *50* *55* *60* *65* *70* *75* *80* *85* *90* *95* *100*

The curvature of the concave horizontal face may range from an arc of a five circle to an arc of a one-foot radius circle with the center point at the center of the hole. Thus the putter may be described as having curvature of the horizontal or striking face ranging from the reciprocal of five feet to the reciprocal of one foot. The curvature is defined as the reciprocal of the radius of a circle. Also provided in accordance with the present invention is a marking on the club head, the marking serving to assist with both aiming and centering.

The best way to hit the golf ball in a short putt is like a pendulum. The most golfers cannot do that consistently, but they tend to swing in an arc. Depending on when the putter strikes the ball in that arc, the putter face may be either slightly open or slightly closed at the impact. Because the concave putter always aims a ball toward the center of the hole, slightly open or closed face hit is compensated enough to make the ball to drop into the hole.

Additionally, for right-handed golfers with conventional putters, balls stroked on the inside the sight line toward the heel will travel left of the intended line to the hole.

Previous tests show that an average golfer almost always impacts on the toe side of the sight line making the ball to travel right of the intended line to the hole. This is so because the player never looks down at the putter head and ball from directly above, but slightly to the heel side of the sight line. The amount of the offset is very small and almost invisible; but, a small misalignment will result in a missed putt. ~~Again, the concave putter will compensate for the small misalignment and make the ball drop into the hole by automatically aiming the ball toward the center of the hole.~~

Tests performed on a flat putting green showed that putts stroked with a straight putter resulted in 20 percent traveling on a line left of center and 20 percent traveling right of the center. Of putts stroked with the concave putter, only 10 percent went left of center and 10 percent went right of the center--a statistically significant improvement.

#### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a putter made in accordance with the present invention having the concave horizontal putting face.

FIG. 2 is a top plan view of a putter of the present invention.

5  
FIG. 3 is a view of an arc formed by a circle drawn from a center of the hole.

10  
FIG. 4 is a top plan view of a concave horizontal putter with paths of a ball hit at any point of the putter face.

FIG. 5 is a top plan view of a conventional straight faced putter with the path of a ball hit at three different points of the putter face.

FIG. 6 is a top plan view of the travel path of the ball when the putter face is open, straight, and closed.

FIG. 7 is a top plan view of the putter of the present invention detailing the relationship of the marking to the radius of the golf ball.

FIG. 8 is a top plan view of a putter of the present invention having an alternative marking.

## DETAILED DESCRIPTION OF THE INVENTION

Reference is now made to the drawing figures showing the improved golf putter 11 illustrated in FIG. 1 and FIG. 2. The putter shown in the drawing is a typical heel and 5 toe weighted putter, but the putter of any other configuration such as a blade-type putter may be used. Regardless of the type, all putters have a club head 9, the club head having a front face 16 which is used to strike the ball, a heel 13, a toe 14, a hosel 12, and a shaft 15. In most of the putter design, the horizontal surface of the face 16 of the putter is flat. In the preferred embodiment of the invention, the face 16 of the 10 putter 11 is curved forming a concave horizontal surface. Curvature of the face 16 of the preferred embodiment is equivalent to the curvature of a circle 20 formed with the center 18 of the hole 17 and radius 19 ranging from five feet to three feet in length as 15 illustrated in FIG. 3. Tangential lines 21, 22, 23 drawn at any point on the circle 20 represent ideal face angles of a putter in order to hit a ball perfectly aimed at the center of the hole. FIG. 4 and FIG. 5 schematically illustrate advantages of the preferred 20 embodiments of the invention 11 over a conventional putter 29. When a ball is hit with the putter of present invention 11, the ball will travel toward the center point 18 of the hole 17 no matter where the impact points 24, 25, 26 are as long as the putter 25 face is aligned perpendicularly toward the hole. However, when a ball is hit with a conventional putter 29, only the ball impacted at the center point of the putter 32 will travel toward the center point 18 of the hole 17. The balls impacted at the points 33, 31 offset from the center 32 will end up at points 27, 28 other than the center point 18, increasing the probability of missing the hole. Statistically, balls traveling toward the center point 18 have significantly higher probability of making the hole than balls traveling toward off-center points 27, 28.

FIG. 6 schematically describes paths of a ball hit with the putter's face with a straight face 29, a closed face 35, and open face 34. When a ball 36 is hit with the putter face 29 perpendicular to the hole, the ball 36 will travel straight 39 path with no side spin.

When a ball 37 is hit with a closed face putter 35, the ball 37 will have slight clockwise side spin and tends to travel right 41 of the center 39. When a ball is hit with an open face putter 34, the ball 38 will have slight counterclockwise side spin and tends to travel left 40 of the center. Since the present invention tends to aim the center point of the hole, small deviation from the straight path is compensated with the concave putter, and a higher percentage of the ball drops into the cup.

In order to assist with aiming, most putters have one or more markings formed on the top face. These markings are generally in the form of one or more straight lines which point in the direction of the hole when the club face is properly oriented. The marking 10 of the club 11 of the present invention consists of a straight line terminating at an arc, the arc having end points terminating at the club face 16. In accordance with the preferred embodiment, the radius of the arc is the length of a line running from the center of a golf ball 50 abutting the front face 16 of the club 11 as may be seen in FIG. 7. Thus, the curvature of the arc of the marking 10 is preferably a function of the distance from the center point of a golf ball 50 abutting the striking face 16, to the point at which the straight line of the marking 10 terminates. The marking 10 aids a golfer by providing a line pointing to the hole as well as a means for assisting with centering the club face 16. The marking 10 may be formed by scoring an arc in the top of the club head 9, and filling in the arc with the desired color paint.

An alternative form of the marking 10 is shown in FIG. 8. This form of the marking 10 is characterized by a solid color arcuate section having a radius as defined above. It should be noted that the primary purpose of the marking 10 is to assist the golfer in aiming and centering the putt. Accordingly, the only requirement for the marking 10, other than having the radius as defined above, is that it be clearly visible to the golfer as he looks down on the club head 9 to center the putt. Thus, the marking 10 may be formed by a raised portion, a sunken portion, or an otherwise contoured arcuate portion (not shown) which may or may not require coloring in order to be easily

visualized by the golfer.

Advantages the preferred embodiment offers over the conventional putter apply to any type of putter design. While the preferred embodiments described herein set forth the best mode to practice this invention presently contemplated by the inventors, numerous modifications and adaptations of this invention will be apparent to others skilled in the art. Therefore, the embodiments are to be considered as illustrative and exemplary and it is understood that the claims are intended to cover such modifications and adaptations as they are considered to be within the scope of the invention.

10

卷之三